

THE CLAIMS

WE CLAIM:

1. A method for coating a medical device comprising a tubular wall having an
5 inner surface, an outer surface and openings therein, wherein the method comprises:
 - (a) grounding or electrically charging the tubular wall;
 - (b) providing a conductive core wire located axially through the tubular wall;
 - (c) applying a potential to the conductive core wire to impart an electrical charge
to the conductive core wire;
 - 10 (d) exposing the tubular wall to an electrically charged coating formulation; and
 - (e) depositing the coating formulation onto a portion of the tubular wall to form
a coating on the tubular wall.
2. The method of claim 1, wherein the coating formulation comprises a
15 polymeric material and a solvent.
3. The method of claim 1, wherein the tubular wall is grounded, and the
conductive core wire and the coating formulation have the same electrical charge.
- 20 4. The method of claim 3, wherein the electrical charge of the coating
formulation and the electrical charge of the conductive core wire are adjusted so that the
charged coating formulation are deposited on the outer surface of the tubular wall and the
inner surface remains substantially free of the charged coating formulation.
- 25 5. The method of claim 1, wherein the tubular wall is grounded, and the
conductive core wire has an electrical charge opposite that of the coating formulation.
6. The method of claim 1, wherein the tubular wall comprises a geometric
center, and the conductive core wire is located axially through the center of the tubular wall.
- 30 7. The method of claim 1, wherein the potential applied to the conductive core
wire is pulsed to cyclically impart a positive electrical charge to the conductive core wire
followed by a negative electrical charge.

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8. The method of claim 7, wherein a positive electrical charge imparted to the conductive core wire is for a shorter duration than the negative electrical charge imparted to the conductive core wire.

5 9. The method of claim 1, wherein the conductive core wire is kept substantially free of the charged coating formulation.

10 10. The method of claim 1, wherein the conductive core wire has two ends and one end of the conductive core wire is connected to a first bobbin and the other end is connected to a second bobbin, wherein the conductive core wire is fed from the first bobbin through the stent, and wherein the conductive core wire covered with the coating formulation is removed from the stent by being connected to the second bobbin.

15 11. The method of claim 1, which further comprises directing the charged coating formulation by providing (a) a first deflector plate having a positive electrical charge and a second deflector plate having a negative electrical charge, which are placed parallel to each other and (b) applying the charged coating formulation between the plates.

20 12. The method of claim 7, wherein the coating formulation have a positive electrical charge, and an electrical potential applied to the tubular wall is repeatedly alternated between grounded and positively charged to deposit a desired amount of the coating formulation on each portion of the tubular wall.

25 13. A method for coating a medical device comprising a tubular wall having an inner surface, an outer surface and openings therein, wherein the method comprises:

- (a) grounding or electrically charging the tubular wall;
- (b) providing a first core wire comprising a resistor material located axially through the tubular wall;
- (c) directing a current through the first core wire;
- 30 (d) creating an electrically charged coating formulation; and
- (e) depositing the coating formulation onto the tubular wall to form a coating on the tubular wall.

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14. The method of claim 13, wherein the coating formulation comprises a polymeric material and a solvent.

5 15. The method of claim 13, wherein the tubular wall comprises two end sections and wherein a greater amount of coating formulation is applied to one end section than the other.

10 16. The method of claim 13, which further comprises providing a second core wire comprising a resistor material through the stent wherein the second core wire is parallel to the first core wire; and directing second current through the second core wire in a direction opposite the first current.

17. The method of claim 13, wherein the first core wire is kept substantially free of the coating formulation.

15 16. The method of claim 13, wherein the first core wire comprising two ends and one end of the first core wire is connected to a first bobbin and the other end is connected to a second bobbin, wherein the first core wire is fed from the first bobbin through the stent, and wherein the first core wire covered with the coating formulation is removed from the
20 stent by being connected to the second bobbin.

19. A method for coating at least a portion of a stent, wherein the stent comprises a stent wall having an inner surface, an outer surface and openings therein, wherein the method comprises:

- 25 (a) grounding or electrically charging the stent wall;
- (b) providing a conductive core wire located axially through the stent;
- (c) applying a potential to the conductive core wire to impart an electrical charge to the conductive core wire;
- (d) exposing the stent to an electrically charged coating formulation; and
- 30 (e) depositing the charged coating formulation onto the stent portion to form a coating on the portion.

20. The method of claim 19, wherein the coating formulation comprises a polymeric material and a solvent.

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21. A method for coating a medical device comprising a tubular wall having an inner surface, an outer surface and openings therein, wherein the method comprises:

- (a) grounding or electrically charging the tubular wall;
- (b) providing a conductive core wire located axially through the tubular wall;
- (c) applying a potential to the conductive core wire to impart an electrical charge to the conductive core wire;
- (d) exposing the tubular wall to an electrically charged coating formulation comprising a biologically active material; and
- (e) depositing the coating formulation onto a portion of the tubular wall to form a coating on the tubular wall.

22. The method of claim 21, wherein the biologically active material comprises an immunosuppressant, an antiproliferative agent, or a combination thereof.

23. The method of claim 22, wherein the immunosuppressant comprises sirolimus, everolimus, tacrolimus, or a combination thereof.

24. The method of claim 22, wherein the antiproliferative agent comprises paclitaxel, an analog thereof, a derivative thereof, or a combination thereof.

25. The method of claim 21, wherein the biologically active material comprises genetic material.

26. The method of claim 21, wherein the coating formulation further comprises a polymeric material and a solvent.

27. The method of claim 21, wherein the tubular wall is grounded, and the conductive core wire and the coating formulation have the same electrical charge.

28. The method of claim 27, wherein the electrical charge of the coating formulation and the electrical charge of the conductive core wire are adjusted so that the charged coating formulation is deposited on the outer surface of the tubular wall and the inner surface remains substantially free of the charged coating formulation.

29. The method of claim 21, wherein the tubular wall is grounded, and the conductive core wire has an electrical charge opposite that of the coating formulation.

30. The method of claim 21, wherein the tubular wall comprises a geometric center, and the conductive core wire is located axially through the center of the tubular wall.

31. The method of claim 21, wherein the potential applied to the conductive core wire is pulsed to cyclically impart a positive electrical charge to the conductive core wire followed by a negative electrical charge.

32. The method of claim 31, wherein a positive electrical charge imparted to the conductive core wire is for a shorter duration than the negative electrical charge imparted to the conductive core wire.

33. The method of claim 21, wherein the conductive core wire is kept substantially free of the charged coating formulation.

34. The method of claim 21, wherein the conductive core wire has two ends and one end of the conductive core wire is connected to a first bobbin and the other end is connected to a second bobbin, wherein the conductive core wire is fed from the first bobbin through the tubular wall, and wherein the conductive core wire covered with the coating formulation is removed from the tubular wall by being connected to the second bobbin.

35. The method of claim 21, which further comprises directing the charged coating formulation by providing (a) a first deflector plate having a positive electrical charge and a second deflector plate having a negative electrical charge, which are placed parallel to each other and (b) applying the charged coating formulation between the plates.

36. The method of claim 31, wherein the coating formulation has a positive electrical charge, and an electrical potential applied to the tubular wall is repeatedly alternated between grounded and positively charged to deposit a desired amount of the coating formulation on each portion of the tubular wall.

37. A method for coating a medical device comprising a tubular wall having an inner surface, an outer surface and openings therein, wherein the method comprises:

- (a) grounding or electrically charging the tubular wall;
- (b) providing a first core wire comprising a resistor material located axially through the tubular wall;
- (c) directing a current through the first core wire;
- (d) creating an electrically charged coating formulation comprising a biologically active material; and
- (e) depositing the coating formulation onto the tubular wall to form a coating on the tubular wall.

38. The method of claim 37, wherein the coating formulation further comprises a polymeric material and a solvent.

39. The method of claim 37, wherein the tubular wall comprises two end sections and wherein a greater amount of coating formulation is applied to one end section than the other.

40. The method of claim 37, which further comprises providing a second core wire comprising a resistor material through the tubular wall wherein the second core wire is parallel to the first core wire; and directing second current through the second core wire in a direction opposite the first current.

41. The method of claim 37, wherein the first core wire is kept substantially free of the coating formulation.

42. The method of claim 37, wherein the first core wire comprises two ends and one end of the first core wire is connected to a first bobbin and the other end is connected to a second bobbin, wherein the first core wire is fed from the first bobbin through the tubular wall, and wherein the first core wire covered with the coating formulation is removed from the tubular wall by being connected to the second bobbin.

43. The method of claim 37, wherein the biologically active material comprises an immunosuppressant, an antiproliferative agent, or a combination thereof.

44. The method of claim 43, wherein the immunosuppressant comprises sirolimus, everolimus, tacrolimus, or a combination thereof.

45. The method of claim 43, wherein the antiproliferative agent comprises paclitaxel, an analog thereof, a derivative thereof, or a combination thereof.

46. The method of claim 37, wherein the biologically active material comprises genetic material.

47. A method for coating at least a portion of a stent, wherein the stent comprises a stent wall having an inner surface, an outer surface and openings therein, wherein the method comprises:

- (a) grounding or electrically charging the stent wall;
- (b) providing a conductive core wire located axially through the stent;
- (c) applying a potential to the conductive core wire to impart an electrical charge to the conductive core wire;
- (d) exposing the stent to an electrically charged coating formulation comprising a biologically active material; and
- (e) depositing the charged coating formulation onto the stent portion to form a coating on the portion.

48. The method of claim 47, wherein the biologically active material comprises an immunosuppressant, an antiproliferative agent, or a combination thereof.

49. The method of claim 48, wherein the immunosuppressant comprises sirolimus, everolimus, tacrolimus, or a combination thereof.

50. The method of claim 48, wherein the antiproliferative agent comprises paclitaxel, an analog thereof, a derivative thereof, or a combination thereof.

51. The method of claim 47, wherein the biologically active material comprises genetic material.

52. The method of claim 43, wherein the coating formulation further comprises a polymeric material and a solvent.